

Application Serial No: 09/983,047  
In reply to Office Action of 03 September 2003

Attorney Docket No. 78381

AMENDMENTS TO THE CLAIMS

1. (newly amended) A sensing device which comprises:

at least one optical fiber supported at two ends in a  
structure with a fiber portion between the two  
ends unsupported by the structure;

a movable mass ~~supported~~ suspended within the  
structure by the unsupported portion of the at  
least one optical fiber; and

means for detecting changes in tension in said at  
least one optical fiber due to movement of said  
movable mass.

2. (original) A sensing device according to claim 1,  
wherein said detecting means comprises at least one fiber  
optic Bragg grating written into a core of each of said  
optical fibers.

3. (newly amended) A sensing device ~~according to claim 2~~  
~~wherein~~ which comprises:

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at least one optical fiber supported in a structure;

a movable mass supported within the structure;

means for detecting changes in tension in said at  
least one optical fiber due to movement of said  
movable mass;

said detecting means comprising at least one fiber  
optic Bragg grating written into a core of each  
of said optical fibers;

said sensing device ~~has~~ having a plurality of optical  
fibers and a first fiber optic Bragg grating  
associated with a first one of said optical  
fibers ~~has~~ having a first reflective wavelength  
and a second fiber optic Bragg grating associated  
with a second one of said optical fibers ~~has~~  
having a second reflective wavelength, which  
second reflective wavelength is different from  
said first reflective wavelength.

4. (original) A sensing device according to claim 2  
wherein said detecting means comprises a plurality of fiber

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optic Bragg gratings associated with each of said optical fibers.

5. (original) A sensing device according to claim 4, wherein each of said fiber optic Bragg gratings associated with each of said optical fibers has a different reflective wavelength.

6. (original) A sensing device according to claim 1, wherein said detecting means comprises a fiber optic Bragg grating laser sensor associated with each of said optical fibers.

7. (newly amended) A sensing device ~~according to claim 1~~ further comprising which comprises:

a plurality of optical fibers supported in ~~said~~ a  
structure;

a movable mass supported within the structure;

means for detecting changes in tension in said at  
least one optical fiber due to movement of said  
movable mass; and

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said movable mass being surrounded by said optical  
fibers and being in contact with said optical  
fibers.

8. (original) A sensing device according to claim 7,  
wherein said structure comprises a cage.

9. (original) A sensing device according to claim 8  
further comprising a gap between each side of said mass and  
said cage and said gap being sufficiently small to limit  
motion of said mass in shock or high acceleration and to  
limit the maximum tension seen by each of said optical  
fibers.

10. (newly amended) A sensing device ~~according to claim 1~~  
~~wherein~~ which comprises:

at least one optical fiber supported in a structure;

a movable mass supported within the structure;

means for detecting changes in tension in said at  
least one optical fiber due to movement of said  
movable mass; and

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said sensing device ~~has~~ having a single optical fiber  
having a serpentine configuration with a  
plurality of legs and wherein said detecting  
means comprises a detector in each of said legs.

11. (newly amended) A sensor for detecting roll in a towed  
array, said sensor comprising:

a plurality of optical fibers supported at two ends in  
a structure, each said optical fiber having a  
fiber portion between said two ends unsupported  
by said structure;

a movable mass ~~supported~~ suspended within the  
structure by the unsupported portions of said  
optical fibers; and

means for detecting changes in tension in each of said  
optical fibers due to movement of said movable  
mass.

12. (original) A sensor according to claim 11 wherein said  
optical fibers are the only deformable structure within the  
sensor.

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13. (newly amended) A sensor for detecting pitch in a  
towed array comprising:

a plurality of optical fibers supported at two ends in  
a structure, each said optical fiber having a  
fiber portion between said two ends unsupported  
by said structure;

a movable mass ~~supported~~ suspended within the  
structure by the unsupported portions of said  
optical fibers; and

means for detecting changes in tension in each of said  
optical fibers due to movement of said movable  
mass.

14. (original) A sensor according to claim 13 wherein  
said optical fibers are the only deformable structures in  
said sensor.